SEQUENCE LISTING

<110> Bachmann, Martin F
Fulurija, Alma

<120> Ghrelin-Carrier Conjugates

<130> 1700.0340001

<150> US 60/396,638
<151> 2002-07-19

<160> 146

<170> PatentIn version 3.2

<210> 1
<211> 172
<212> PRT
<213> Escherichia coli

<400> 1

Met Ala Val Val Ser Phe Gly Val Asn Ala Ala Pro Thr Thr Pro Gln
1 5 10 15

Gly Gln Gly Arg Val Thr Phe Asn Gly Thr Val Val Asp Ala Pro Cys
20 25 30

Ser Ile Ser Gln Lys Ser Ala Asp Gln Ser Ile Asp Phe Gly Gln Leu
35 40 45

Ser Lys Ser Phe Leu Ala Asn Asp Gly Gln Ser Lys Pro Met Asn Leu
50 55 60

Asp Ile Glu Leu Val Asn Cys Asp Ile Thr Ala Phe Lys Asn Gly Asn
65 70 75 80

Ala Lys Thr Gly Ser Val Lys Leu Ala Phe Thr Gly Pro Thr Val Ser
85 90 95

Gly His Pro Ser Glu Leu Ala Thr Asn Gly Gly Pro Gly Thr Ala Ile
100 105 110

Met Ile Gln Ala Ala Gly Lys Asn Val Pro Phe Asp Gly Thr Glu Gly
115 120 125

Asp Pro Asn Leu Leu Lys Asp Gly Asp Asn Val Leu His Tyr Thr Thr
130 135 140

Val Gly Lys Lys Ser Ser Asp Gly Asn Ala Gln Ile Thr Glu Gly Ala
145 150 155 160

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Phe Ser Gly Val Ala Thr Phe Asn Leu Ser Tyr Gln
                165                 170
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<210> 2
<211> 182
<212> PRT
<213> Escherichia coli

<400> 2

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Met Lys Ile Lys Thr Leu Ala Ile Val Val Leu Ser Ala Leu Ser Leu
1               5                   10                  15

Ser Ser Thr Ala Ala Leu Ala Ala Ala Thr Thr Val Asn Gly Gly Thr
            20                  25                  30

Val His Phe Lys Gly Glu Val Val Asn Ala Ala Cys Ala Val Asp Ala
        35                  40                  45

Gly Ser Val Asp Gln Thr Val Gln Leu Gly Gln Val Arg Thr Ala Ser
    50                  55                  60

Leu Ala Gln Glu Gly Ala Thr Ser Ser Ala Val Gly Phe Asn Ile Gln
65                  70                  75                  80

Leu Asn Asp Cys Asp Thr Asn Val Ala Ser Lys Ala Ala Val Ala Phe
                85                  90                  95

Leu Gly Thr Ala Ile Asp Ala Gly His Thr Asn Val Leu Ala Leu Gln
            100                 105                 110

Ser Ser Ala Ala Gly Ser Ala Thr Asn Val Gly Val Gln Ile Leu Asp
        115                 120                 125

Arg Thr Gly Ala Ala Leu Thr Leu Asp Gly Ala Thr Phe Ser Ser Glu
    130                 135                 140

Thr Thr Leu Asn Asn Gly Thr Asn Thr Ile Pro Phe Gln Ala Arg Tyr
145                 150                 155                 160

Phe Ala Thr Gly Ala Ala Thr Pro Gly Ala Ala Asn Ala Asp Ala Thr
                165                 170                 175

Phe Lys Val Gln Tyr Gln
            180
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<210> 3
<211> 853

<212> DNA
<213> Escherichia coli

<400> 3
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gtttgtccgc gatgctttac ctctatgagt caaaatggcc ccaatgtttc atcttttggg 180

ggaaactgtg cagtgttggc agtcaaactc gttgacaaac aaagtgtaca gaacgactgc 240

ccatgtcgat ttagaaatag ttttttgaaa ggaaagcagc atgaaaatta aaactctggc 300

aatcgttgtt ctgtcggctc tgtccctcag ttctacgacg gctctggccg ctgccacgac 360

ggttaatggt gggaccgttc actttaaagg ggaagttgtt aacgccgctt gcgcagttga 420

tgcaggctct gttgatcaaa ccgttcagtt aggacaggtt cgtaccgcat cgctggcaca 480

ggaaggagca accagttctg ctgtcggttt taacattcag ctgaatgatt gcgataccaa 540

tgttgcatct aaagccgctg ttgccttttt aggtacggcg attgatgcgg gtcataccaa 600

cgttctggct ctgcagagtt cagctgcggg tagcgcaaca aacgttggtg tgcagatcct 660

ggacagaacg ggtgctgcgc tgacgctgga tggtgcgaca tttagttcag aaacaaccct 720

gaataacgga accaatacca ttccgttcca ggcgcgttat tttgcaaccg gggccgcaac 780

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tcagggacgt tca 853

<210> 4
<211> 132
<212> PRT
<213> Bacteriophage Q-beta

<400> 4

Ala Lys Leu Glu Thr Val Thr Leu Gly Asn Ile Gly Lys Asp Gly Lys
1 5 10 15

Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly Val
20 25 30

Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val
35 40 45

Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys Val
50 55 60

Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser Cys
65 70 75 80

```
Asp Pro Ser Val Thr Arg Gln Ala Tyr Ala Asp Val Thr Phe Ser Phe
                85                  90                  95

Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu Leu
            100                 105                 110

Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln Leu
        115                 120                 125

Asn Pro Ala Tyr
    130
```

<210> 5
<211> 329
<212> PRT
<213> Bacteriophage Q-beta

<400> 5

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Met Ala Lys Leu Glu Thr Val Thr Leu Gly Asn Ile Gly Lys Asp Gly
1               5                   10                  15

Lys Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly
            20                  25                  30

Val Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg
        35                  40                  45

Val Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys
    50                  55                  60

Val Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser
65                  70                  75                  80

Cys Asp Pro Ser Val Thr Arg Gln Ala Tyr Ala Asp Val Thr Phe Ser
                85                  90                  95

Phe Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu
            100                 105                 110

Leu Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln
        115                 120                 125

Leu Asn Pro Ala Tyr Trp Thr Leu Leu Ile Ala Gly Gly Gly Ser Gly
    130                 135                 140

Ser Lys Pro Asp Pro Val Ile Pro Asp Pro Pro Ile Asp Pro Pro Pro
145                 150                 155                 160
```

```
Gly Thr Gly Lys Tyr Thr Cys Pro Phe Ala Ile Trp Ser Leu Glu Glu
                165                 170                 175

Val Tyr Glu Pro Pro Thr Lys Asn Arg Pro Trp Pro Ile Tyr Asn Ala
            180                 185                 190

Val Glu Leu Gln Pro Arg Glu Phe Asp Val Ala Leu Lys Asp Leu Leu
        195                 200                 205

Gly Asn Thr Lys Trp Arg Asp Trp Asp Ser Arg Leu Ser Tyr Thr Thr
    210                 215                 220

Phe Arg Gly Cys Arg Gly Asn Gly Tyr Ile Asp Leu Asp Ala Thr Tyr
225                 230                 235                 240

Leu Ala Thr Asp Gln Ala Met Arg Asp Gln Lys Tyr Asp Ile Arg Glu
                245                 250                 255

Gly Lys Lys Pro Gly Ala Phe Gly Asn Ile Glu Arg Phe Ile Tyr Leu
            260                 265                 270

Lys Ser Ile Asn Ala Tyr Cys Ser Leu Ser Asp Ile Ala Ala Tyr His
        275                 280                 285

Ala Asp Gly Val Ile Val Gly Phe Trp Arg Asp Pro Ser Ser Gly Gly
    290                 295                 300

Ala Ile Pro Phe Asp Phe Thr Lys Phe Asp Lys Thr Lys Cys Pro Ile
305                 310                 315                 320

Gln Ala Val Ile Val Val Pro Arg Ala
                325
```

<210> 6
<211> 129
<212> PRT
<213> Bacteriophage R17

<400> 6

```
Ala Ser Asn Phe Thr Gln Phe Val Leu Val Asn Asp Gly Gly Thr Gly
1               5                   10                  15

Asn Val Thr Val Ala Pro Ser Asn Phe Ala Asn Gly Val Ala Glu Trp
            20                  25                  30

Ile Ser Ser Asn Ser Arg Ser Gln Ala Tyr Lys Val Thr Cys Ser Val
        35                  40                  45
```

```
Arg Gln Ser Ser Ala Gln Asn Arg Lys Tyr Thr Ile Lys Val Glu Val
    50                  55                  60

Pro Lys Val Ala Thr Gln Thr Val Gly Gly Val Glu Leu Pro Val Ala
65                  70                  75                  80

Ala Trp Arg Ser Tyr Leu Asn Met Glu Leu Thr Ile Pro Ile Phe Ala
                85                  90                  95

Thr Asn Ser Asp Cys Glu Leu Ile Val Lys Ala Met Gln Gly Leu Leu
            100                 105                 110

Lys Asp Gly Asn Pro Ile Pro Ser Ala Ile Ala Ala Asn Ser Gly Ile
        115                 120                 125

Tyr
```

<210> 7
<211> 130
<212> PRT
<213> Bacteriophage fr

<400> 7

```
Met Ala Ser Asn Phe Glu Glu Phe Val Leu Val Asp Asn Gly Gly Thr
1               5                   10                  15

Gly Asp Val Lys Val Ala Pro Ser Asn Phe Ala Asn Gly Val Ala Glu
            20                  25                  30

Trp Ile Ser Ser Asn Ser Arg Ser Gln Ala Tyr Lys Val Thr Cys Ser
        35                  40                  45

Val Arg Gln Ser Ser Ala Asn Asn Arg Lys Tyr Thr Val Lys Val Glu
    50                  55                  60

Val Pro Lys Val Ala Thr Gln Val Gln Gly Gly Val Glu Leu Pro Val
65                  70                  75                  80

Ala Ala Trp Arg Ser Tyr Met Asn Met Glu Leu Thr Ile Pro Val Phe
                85                  90                  95

Ala Thr Asn Asp Asp Cys Ala Leu Ile Val Lys Ala Leu Gln Gly Thr
            100                 105                 110

Phe Lys Thr Gly Asn Pro Ile Ala Thr Ala Ile Ala Ala Asn Ser Gly
```

115 120 125

Ile Tyr
130

<210> 8
<211> 130
<212> PRT
<213> Bacteriophage GA

<400> 8

Met Ala Thr Leu Arg Ser Phe Val Leu Val Asp Asn Gly Gly Thr Gly
1 5 10 15

Asn Val Thr Val Val Pro Val Ser Asn Ala Asn Gly Val Ala Glu Trp
20 25 30

Leu Ser Asn Asn Ser Arg Ser Gln Ala Tyr Arg Val Thr Ala Ser Tyr
35 40 45

Arg Ala Ser Gly Ala Asp Lys Arg Lys Tyr Ala Ile Lys Leu Glu Val
50 55 60

Pro Lys Ile Val Thr Gln Val Val Asn Gly Val Glu Leu Pro Gly Ser
65 70 75 80

Ala Trp Lys Ala Tyr Ala Ser Ile Asp Leu Thr Ile Pro Ile Phe Ala
85 90 95

Ala Thr Asp Asp Val Thr Val Ile Ser Lys Ser Leu Ala Gly Leu Phe
100 105 110

Lys Val Gly Asn Pro Ile Ala Glu Ala Ile Ser Ser Gln Ser Gly Phe
115 120 125

Tyr Ala
130

<210> 9
<211> 132
<212> PRT
<213> Bacteriophage SP

<400> 9

Met Ala Lys Leu Asn Gln Val Thr Leu Ser Lys Ile Gly Lys Asn Gly
1 5 10 15

Asp Gln Thr Leu Thr Leu Thr Pro Arg Gly Val Asn Pro Thr Asn Gly

20 25 30

Val Ala Ser Leu Ser Glu Ala Gly Ala Val Pro Ala Leu Glu Lys Arg
35 40 45

Val Thr Val Ser Val Ala Gln Pro Ser Arg Asn Arg Lys Asn Phe Lys
50 55 60

Val Gln Ile Lys Leu Gln Asn Pro Thr Ala Cys Thr Arg Asp Ala Cys
65 70 75 80

Asp Pro Ser Val Thr Arg Ser Ala Phe Ala Asp Val Thr Leu Ser Phe
85 90 95

Thr Ser Tyr Ser Thr Asp Glu Glu Arg Ala Leu Ile Arg Thr Glu Leu
100 105 110

Ala Ala Leu Leu Ala Asp Pro Leu Ile Val Asp Ala Ile Asp Asn Leu
115 120 125

Asn Pro Ala Tyr
130

<210> 10
<211> 329
<212> PRT
<213> Bacteriophage SP

<400> 10

Ala Lys Leu Asn Gln Val Thr Leu Ser Lys Ile Gly Lys Asn Gly Asp
1 5 10 15

Gln Thr Leu Thr Leu Thr Pro Arg Gly Val Asn Pro Thr Asn Gly Val
20 25 30

Ala Ser Leu Ser Glu Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val
35 40 45

Thr Val Ser Val Ala Gln Pro Ser Arg Asn Arg Lys Asn Phe Lys Val
50 55 60

Gln Ile Lys Leu Gln Asn Pro Thr Ala Cys Thr Arg Asp Ala Cys Asp
65 70 75 80

Pro Ser Val Thr Arg Ser Ala Phe Ala Asp Val Thr Leu Ser Phe Thr
85 90 95

```
Ser Tyr Ser Thr Asp Glu Glu Arg Ala Leu Ile Arg Thr Glu Leu Ala
            100                 105                 110

Ala Leu Leu Ala Asp Pro Leu Ile Val Asp Ala Ile Asp Asn Leu Asn
        115                 120                 125

Pro Ala Tyr Trp Ala Ala Leu Leu Val Ala Ser Ser Gly Gly Gly Asp
    130                 135                 140

Asn Pro Ser Asp Pro Asp Val Pro Val Val Pro Asp Val Lys Pro Pro
145                 150                 155                 160

Asp Gly Thr Gly Arg Tyr Lys Cys Pro Phe Ala Cys Tyr Arg Leu Gly
                165                 170                 175

Ser Ile Tyr Glu Val Gly Lys Glu Gly Ser Pro Asp Ile Tyr Glu Arg
            180                 185                 190

Gly Asp Glu Val Ser Val Thr Phe Asp Tyr Ala Leu Glu Asp Phe Leu
        195                 200                 205

Gly Asn Thr Asn Trp Arg Asn Trp Asp Gln Arg Leu Ser Asp Tyr Asp
    210                 215                 220

Ile Ala Asn Arg Arg Arg Cys Arg Gly Asn Gly Tyr Ile Asp Leu Asp
225                 230                 235                 240

Ala Thr Ala Met Gln Ser Asp Asp Phe Val Leu Ser Gly Arg Tyr Gly
                245                 250                 255

Val Arg Lys Val Lys Phe Pro Gly Ala Phe Gly Ser Ile Lys Tyr Leu
            260                 265                 270

Leu Asn Ile Gln Gly Asp Ala Trp Leu Asp Leu Ser Glu Val Thr Ala
        275                 280                 285

Tyr Arg Ser Tyr Gly Met Val Ile Gly Phe Trp Thr Asp Ser Lys Ser
    290                 295                 300

Pro Gln Leu Pro Thr Asp Phe Thr Gln Phe Asn Ser Ala Asn Cys Pro
305                 310                 315                 320

Val Gln Thr Val Ile Ile Ile Pro Ser
                325
```

<210> 11
<211> 130

<212> PRT
<213> Bacteriophage MS2

<400> 11

Met Ala Ser Asn Phe Thr Gln Phe Val Leu Val Asp Asn Gly Gly Thr
1 5 10 15

Gly Asp Val Thr Val Ala Pro Ser Asn Phe Ala Asn Gly Val Ala Glu
20 25 30

Trp Ile Ser Ser Asn Ser Arg Ser Gln Ala Tyr Lys Val Thr Cys Ser
35 40 45

Val Arg Gln Ser Ser Ala Gln Asn Arg Lys Tyr Thr Ile Lys Val Glu
50 55 60

Val Pro Lys Val Ala Thr Gln Thr Val Gly Gly Val Glu Leu Pro Val
65 70 75 80

Ala Ala Trp Arg Ser Tyr Leu Asn Met Glu Leu Thr Ile Pro Ile Phe
85 90 95

Ala Thr Asn Ser Asp Cys Glu Leu Ile Val Lys Ala Met Gln Gly Leu
100 105 110

Leu Lys Asp Gly Asn Pro Ile Pro Ser Ala Ile Ala Ala Asn Ser Gly
115 120 125

Ile Tyr
130

<210> 12
<211> 133
<212> PRT
<213> Bacteriophage M11

<400> 12

Met Ala Lys Leu Gln Ala Ile Thr Leu Ser Gly Ile Gly Lys Lys Gly
1 5 10 15

Asp Val Thr Leu Asp Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly
20 25 30

Val Ala Ala Leu Ser Glu Ala Gly Ala Val Pro Ala Leu Glu Lys Arg
35 40 45

Val Thr Ile Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys
50 55 60

```
Val Gln Val Lys Ile Gln Asn Pro Thr Ser Cys Thr Ala Ser Gly Thr
65                  70                  75                  80

Cys Asp Pro Ser Val Thr Arg Ser Ala Tyr Ser Asp Val Thr Phe Ser
                85                  90                  95

Phe Thr Gln Tyr Ser Thr Val Glu Glu Arg Ala Leu Val Arg Thr Glu
            100                 105                 110

Leu Gln Ala Leu Leu Ala Asp Pro Met Leu Val Asn Ala Ile Asp Asn
        115                 120                 125

Leu Asn Pro Ala Tyr
    130
```

<210> 13
<211> 133
<212> PRT
<213> Bacteriophage MX1

<400> 13

```
Met Ala Lys Leu Gln Ala Ile Thr Leu Ser Gly Ile Gly Lys Asn Gly
1               5                   10                  15

Asp Val Thr Leu Asn Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly
            20                  25                  30

Val Ala Ala Leu Ser Glu Ala Gly Ala Val Pro Ala Leu Glu Lys Arg
        35                  40                  45

Val Thr Ile Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys
    50                  55                  60

Val Gln Val Lys Ile Gln Asn Pro Thr Ser Cys Thr Ala Ser Gly Thr
65                  70                  75                  80

Cys Asp Pro Ser Val Thr Arg Ser Ala Tyr Ala Asp Val Thr Phe Ser
                85                  90                  95

Phe Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Leu Val Arg Thr Glu
            100                 105                 110

Leu Lys Ala Leu Leu Ala Asp Pro Met Leu Ile Asp Ala Ile Asp Asn
        115                 120                 125

Leu Asn Pro Ala Tyr
```

130

<210> 14
<211> 330
<212> PRT
<213> Bacteriophage NL95

<400> 14

Met Ala Lys Leu Asn Lys Val Thr Leu Thr Gly Ile Gly Lys Ala Gly
1 5 10 15

Asn Gln Thr Leu Thr Leu Thr Pro Arg Gly Val Asn Pro Thr Asn Gly
20 25 30

Val Ala Ser Leu Ser Glu Ala Gly Ala Val Pro Ala Leu Glu Lys Arg
35 40 45

Val Thr Val Ser Val Ala Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys
50 55 60

Val Gln Ile Lys Leu Gln Asn Pro Thr Ala Cys Thr Lys Asp Ala Cys
65 70 75 80

Asp Pro Ser Val Thr Arg Ser Gly Ser Arg Asp Val Thr Leu Ser Phe
85 90 95

Thr Ser Tyr Ser Thr Glu Arg Glu Arg Ala Leu Ile Arg Thr Glu Leu
100 105 110

Ala Ala Leu Leu Lys Asp Asp Leu Ile Val Asp Ala Ile Asp Asn Leu
115 120 125

Asn Pro Ala Tyr Trp Ala Ala Leu Leu Ala Ala Ser Pro Gly Gly Gly
130 135 140

Asn Asn Pro Tyr Pro Gly Val Pro Asp Ser Pro Asn Val Lys Pro Pro
145 150 155 160

Gly Gly Thr Gly Thr Tyr Arg Cys Pro Phe Ala Cys Tyr Arg Arg Gly
165 170 175

Glu Leu Ile Thr Glu Ala Lys Asp Gly Ala Cys Ala Leu Tyr Ala Cys
180 185 190

Gly Ser Glu Ala Leu Val Glu Phe Glu Tyr Ala Leu Glu Asp Phe Leu
195 200 205

```
Gly Asn Glu Phe Trp Arg Asn Trp Asp Gly Arg Leu Ser Lys Tyr Asp
    210                 215                 220

Ile Glu Thr His Arg Arg Cys Arg Gly Asn Gly Tyr Val Asp Leu Asp
225                 230                 235                 240

Ala Ser Val Met Gln Ser Asp Glu Tyr Val Leu Ser Gly Ala Tyr Asp
                245                 250                 255

Val Val Lys Met Gln Pro Pro Gly Thr Phe Asp Ser Pro Arg Tyr Tyr
            260                 265                 270

Leu His Leu Met Asp Gly Ile Tyr Val Asp Leu Ala Glu Val Thr Ala
        275                 280                 285

Tyr Arg Ser Tyr Gly Met Val Ile Gly Phe Trp Thr Asp Ser Lys Ser
    290                 295                 300

Pro Gln Leu Pro Thr Asp Phe Thr Arg Phe Asn Arg His Asn Cys Pro
305                 310                 315                 320

Val Gln Thr Val Ile Val Ile Pro Ser Leu
                325                 330
```

<210> 15
<211> 129
<212> PRT
<213> Bacteriophage f2

<400> 15

```
Ala Ser Asn Phe Thr Gln Phe Val Leu Val Asn Asp Gly Gly Thr Gly
1               5                   10                  15

Asn Val Thr Val Ala Pro Ser Asn Phe Ala Asn Gly Val Ala Glu Trp
            20                  25                  30

Ile Ser Ser Asn Ser Arg Ser Gln Ala Tyr Lys Val Thr Cys Ser Val
        35                  40                  45

Arg Gln Ser Ser Ala Gln Asn Arg Lys Tyr Thr Ile Lys Val Glu Val
    50                  55                  60

Pro Lys Val Ala Thr Gln Thr Val Gly Gly Val Glu Leu Pro Val Ala
65                  70                  75                  80

Ala Trp Arg Ser Tyr Leu Asn Leu Glu Leu Thr Ile Pro Ile Phe Ala
                85                  90                  95
```

```
Thr Asn Ser Asp Cys Glu Leu Ile Val Lys Ala Met Gln Gly Leu Leu
            100                 105                 110

Lys Asp Gly Asn Pro Ile Pro Ser Ala Ile Ala Ala Asn Ser Gly Ile
        115                 120                 125

Tyr
```

<210> 16
<211> 128
<212> PRT
<213> Bacteriophage PP7

<400> 16

```
Met Ser Lys Thr Ile Val Leu Ser Val Gly Glu Ala Thr Arg Thr Leu
1               5                   10                  15

Thr Glu Ile Gln Ser Thr Ala Asp Arg Gln Ile Phe Glu Glu Lys Val
            20                  25                  30

Gly Pro Leu Val Gly Arg Leu Arg Leu Thr Ala Ser Leu Arg Gln Asn
        35                  40                  45

Gly Ala Lys Thr Ala Tyr Arg Val Asn Leu Lys Leu Asp Gln Ala Asp
    50                  55                  60

Val Val Asp Cys Ser Thr Ser Val Cys Gly Glu Leu Pro Lys Val Arg
65                  70                  75                  80

Tyr Thr Gln Val Trp Ser His Asp Val Thr Ile Val Ala Asn Ser Thr
                85                  90                  95

Glu Ala Ser Arg Lys Ser Leu Tyr Asp Leu Thr Lys Ser Leu Val Ala
            100                 105                 110

Thr Ser Gln Val Glu Asp Leu Val Val Asn Leu Val Pro Leu Gly Arg
        115                 120                 125
```

<210> 17
<211> 132
<212> PRT
<213> Artificial Sequence

<220>
<223> Bacteriophage Qbeta 240 mutant

<400> 17

```
Ala Lys Leu Glu Thr Val Thr Leu Gly Asn Ile Gly Arg Asp Gly Lys
1               5                   10                  15

Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly Val
            20                  25                  30

Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val
        35                  40                  45

Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys Val
    50                  55                  60

Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser Cys
65                  70                  75                  80

Asp Pro Ser Val Thr Arg Gln Lys Tyr Ala Asp Val Thr Phe Ser Phe
                85                  90                  95

Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu Leu
            100                 105                 110

Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln Leu
        115                 120                 125

Asn Pro Ala Tyr
    130
```

<210> 18
<211> 132
<212> PRT
<213> Artificial Sequence

<220>
<223> Bacteriophage Q-beta 243 mutant

<400> 18

```
Ala Lys Leu Glu Thr Val Thr Leu Gly Lys Ile Gly Lys Asp Gly Lys
1               5                   10                  15

Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly Val
            20                  25                  30

Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val
        35                  40                  45

Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys Val
    50                  55                  60
```

Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser Cys
65 70 75 80

Asp Pro Ser Val Thr Arg Gln Lys Tyr Ala Asp Val Thr Phe Ser Phe
85 90 95

Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu Leu
100 105 110

Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln Leu
115 120 125

Asn Pro Ala Tyr
130

<210> 19
<211> 132
<212> PRT
<213> Artificial Sequence

<220>
<223> Bacteriophage Q-beta 250 mutant

<400> 19

Ala Arg Leu Glu Thr Val Thr Leu Gly Asn Ile Gly Arg Asp Gly Lys
1 5 10 15

Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly Val
20 25 30

Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val
35 40 45

Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys Val
50 55 60

Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser Cys
65 70 75 80

Asp Pro Ser Val Thr Arg Gln Lys Tyr Ala Asp Val Thr Phe Ser Phe
85 90 95

Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu Leu
100 105 110

Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln Leu
115 120 125

Asn Pro Ala Tyr
130

<210> 20
<211> 132
<212> PRT
<213> Artificial Sequence

<220>
<223> Bacteriophage Q-beta 251 mutant

<400> 20

Ala Lys Leu Glu Thr Val Thr Leu Gly Asn Ile Gly Lys Asp Gly Arg
1 5 10 15

Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly Val
20 25 30

Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val
35 40 45

Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys Val
50 55 60

Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser Cys
65 70 75 80

Asp Pro Ser Val Thr Arg Gln Lys Tyr Ala Asp Val Thr Phe Ser Phe
85 90 95

Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu Leu
100 105 110

Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln Leu
115 120 125

Asn Pro Ala Tyr
130

<210> 21
<211> 132
<212> PRT
<213> Artificial Sequence

<220>
<223> Bacteriophage Q-beta 259 mutant

<400> 21

Ala Arg Leu Glu Thr Val Thr Leu Gly Asn Ile Gly Lys Asp Gly Arg
1 5 10 15

```
Gln Thr Leu Val Leu Asn Pro Arg Gly Val Asn Pro Thr Asn Gly Val
            20                  25                  30

Ala Ser Leu Ser Gln Ala Gly Ala Val Pro Ala Leu Glu Lys Arg Val
        35                  40                  45

Thr Val Ser Val Ser Gln Pro Ser Arg Asn Arg Lys Asn Tyr Lys Val
    50                  55                  60

Gln Val Lys Ile Gln Asn Pro Thr Ala Cys Thr Ala Asn Gly Ser Cys
65                  70                  75                  80

Asp Pro Ser Val Thr Arg Gln Lys Tyr Ala Asp Val Thr Phe Ser Phe
                85                  90                  95

Thr Gln Tyr Ser Thr Asp Glu Glu Arg Ala Phe Val Arg Thr Glu Leu
            100                 105                 110

Ala Ala Leu Leu Ala Ser Pro Leu Leu Ile Asp Ala Ile Asp Gln Leu
        115                 120                 125

Asn Pro Ala Tyr
    130
```

<210> 22
<211> 185
<212> PRT
<213> Hepatitis B virus

<400> 22

```
Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
1               5                   10                  15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
            20                  25                  30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
        35                  40                  45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
    50                  55                  60

Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
65                  70                  75                  80

Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys
```

85 90 95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
130 135 140

Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg
145 150 155 160

Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg
165 170 175

Arg Ser Gln Ser Arg Glu Ser Gln Cys
180 185

<210> 23
<211> 212
<212> PRT
<213> Hepatitis B virus

<400> 23

Met Gln Leu Phe His Leu Cys Leu Ile Ile Ser Cys Ser Cys Pro Thr
1 5 10 15

Val Gln Ala Ser Lys Leu Cys Leu Gly Trp Leu Trp Gly Met Asp Ile
20 25 30

Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu
35 40 45

Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser
50 55 60

Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His
65 70 75 80

His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Asp Leu Met Asn
85 90 95

Leu Ala Thr Trp Val Gly Gly Asn Leu Glu Asp Pro Val Ser Arg Asp
100 105 110

```
Leu Val Val Gly Tyr Val Asn Thr Thr Val Gly Leu Lys Phe Arg Gln
        115                 120                 125

Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val
    130                 135                 140

Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala
145                 150                 155                 160

Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr
                165                 170                 175

Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro
            180                 185                 190

Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg
        195                 200                 205

Glu Ser Gln Cys
    210
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<210> 24
<211> 188
<212> PRT
<213> Hepatitis B virus

<400> 24

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Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
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Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp
            20                  25                  30

Thr Ala Thr Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
        35                  40                  45

Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Asp Glu
    50                  55                  60

Leu Thr Lys Leu Ile Ala Trp Met Ser Ser Asn Ile Thr Ser Glu Gln
65                  70                  75                  80

Val Arg Thr Ile Ile Val Asn His Val Asn Asp Thr Trp Gly Leu Lys
                85                  90                  95

Val Arg Gln Ser Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln
            100                 105                 110
```

```
His Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr
        115                 120                 125

Pro Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
    130                 135                 140

Glu His Thr Val Ile Arg Arg Arg Gly Gly Ala Arg Ala Ser Arg Ser
145                 150                 155                 160

Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro
                165                 170                 175

Arg Arg Arg Arg Ser Gln Ser Pro Ser Thr Asn Cys
            180                 185
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<210> 25
<211> 185
<212> PRT
<213> Hepatitis B virus

<400> 25

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Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
1               5                   10                  15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
            20                  25                  30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
        35                  40                  45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
    50                  55                  60

Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
65                  70                  75                  80

Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys
                85                  90                  95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
            100                 105                 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
        115                 120                 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
    130                 135                 140
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Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg
145 150 155 160

Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg
165 170 175

Arg Ser Gln Ser Arg Glu Ser Gln Cys
180 185

<210> 26
<211> 152
<212> PRT
<213> Hepatitis B virus

<400> 26

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
20 25 30

Thr Ala Ala Ala Leu Tyr Arg Asp Ala Leu Glu Ser Pro Glu His Cys
35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Asp
50 55 60

Leu Met Thr Leu Ala Thr Trp Val Gly Thr Asn Leu Glu Asp Gly Gly
65 70 75 80

Lys Gly Gly Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn Val
85 90 95

Gly Leu Lys Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr
100 105 110

Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp
115 120 125

Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser
130 135 140

Thr Leu Pro Glu Thr Thr Val Val
145 150

<210> 27

<211> 3635
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAP283-58

<400> 27
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ggaaaatcac atggcaaata agccaatgca accgatcaca tctacagcaa ataaaattgt 180

gtggtcggat ccaactcgtt tatcaactac attttcagca agtctgttac gccaacgtgt 240

taaagttggt atagccgaac tgaataatgt ttcaggtcaa tatgtatctg tttataagcg 300

tcctgcacct aaaccggaag gttgtgcaga tgcctgtgtc attatgccga atgaaaacca 360

atccattcgc acagtgattt cagggtcagc cgaaaacttg gctaccttaa aagcagaatg 420

ggaaactcac aaacgtaacg ttgacacact cttcgcgagc ggcaacgccg gtttgggttt 480

ccttgaccct actgcggcta tcgtatcgtc tgatactact gcttaagctt gtattctata 540

gtgtcaccta aatcgtatgt gtatgataca taaggttatg tattaattgt agccgcgttc 600

taacgacaat atgtacaagc ctaattgtgt agcatctggc ttactgaagc agaccctatc 660

atctctctcg taaactgccg tcagagtcgg tttggttgga cgaaccttct gagtttctgg 720

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gcgcttgttt cggcgtgggt atggtggcag gccccgtggc cgggggactg ttgggcgcca 960

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caatctgctc tgatgccgca tagttaagcc aactccgcta tcgctacgtg actgggtcat 1140

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tttttatagg ttaatgtcat gataataatg gtttcttaga cgtcaggtgg cacttttcgg 1380

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attcaacatt tccgtgtcgc ccttattccc ttttttgcgg cattttgcct tcctgttttt 1560

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gctgccataa ccatgagtga taacactgcg gccaacttac ttctgacaac gatcggagga 1920

ccgaaggagc taaccgcttt tttgcacaac atgggggatc atgtaactcg ccttgatcgt 1980

tgggaaccgg agctgaatga agccatacca aacgacgagc gtgacaccac gatgcctgta 2040

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caacaattaa tagactggat ggaggcggat aaagttgcag gaccacttct gcgctcggcc 2160

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cctgcgttat cccctgattc tgtggataac cgtattaccg cctttgagtg agctgatacc 3240

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tacgcaagtt cacgtaaaaa gggtatcgcg gaatt 3635

<210> 28
<211> 131
<212> PRT
<213> Bacteriophage AP205

<400> 28

Met Ala Asn Lys Pro Met Gln Pro Ile Thr Ser Thr Ala Asn Lys Ile
1 5 10 15

Val Trp Ser Asp Pro Thr Arg Leu Ser Thr Thr Phe Ser Ala Ser Leu
20 25 30

Leu Arg Gln Arg Val Lys Val Gly Ile Ala Glu Leu Asn Asn Val Ser
35 40 45

Gly Gln Tyr Val Ser Val Tyr Lys Arg Pro Ala Pro Lys Pro Glu Gly
50 55 60

Cys Ala Asp Ala Cys Val Ile Met Pro Asn Glu Asn Gln Ser Ile Arg
65 70 75 80

Thr Val Ile Ser Gly Ser Ala Glu Asn Leu Ala Thr Leu Lys Ala Glu
85 90 95

Trp Glu Thr His Lys Arg Asn Val Asp Thr Leu Phe Ala Ser Gly Asn
100 105 110

Ala Gly Leu Gly Phe Leu Asp Pro Thr Ala Ala Ile Val Ser Ser Asp
115 120 125

Thr Thr Ala
130

<210> 29
<211> 131
<212> PRT
<213> Artificial Sequence

<220>
<223> AP205 coat protein

<400> 29

Met Ala Asn Lys Thr Met Gln Pro Ile Thr Ser Thr Ala Asn Lys Ile
1 5 10 15

Val Trp Ser Asp Pro Thr Arg Leu Ser Thr Thr Phe Ser Ala Ser Leu
20 25 30

Leu Arg Gln Arg Val Lys Val Gly Ile Ala Glu Leu Asn Asn Val Ser
35 40 45

Gly Gln Tyr Val Ser Val Tyr Lys Arg Pro Ala Pro Lys Pro Glu Gly
50 55 60

Cys Ala Asp Ala Cys Val Ile Met Pro Asn Glu Asn Gln Ser Ile Arg
65 70 75 80

Thr Val Ile Ser Gly Ser Ala Glu Asn Leu Ala Thr Leu Lys Ala Glu
85 90 95

Trp Glu Thr His Lys Arg Asn Val Asp Thr Leu Phe Ala Ser Gly Asn
100 105 110

Ala Gly Leu Gly Phe Leu Asp Pro Thr Ala Ala Ile Val Ser Ser Asp
115 120 125

Thr Thr Ala
130

<210> 30
<211> 3607
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAP281-32

<400> 30
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acaatgcaac cgatcacatc tacagcaaat aaaattgtgt ggtcggatcc aactcgttta 180

tcaactacat tttcagcaag tctgttacgc caacgtgtta aagttggtat agccgaactg 240

aataatgttt caggtcaata tgtatctgtt tataagcgtc ctgcacctaa accgaaggtc 300

agatgcctgt gtcattatgc cgaatgaaaa ccaatccatt cgcacagtga tttcagggtc 360

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actcttcgcg agcggcaacg ccggtttggg tttccttgac cctactgcgg ctatcgtatc 480

gtctgatact actgcttaag cttgtattct atagtgtcac ctaaatcgta tgtgtatgat 540

acataaggtt atgtattaat ggtagccgcg ttctaacgac aatatgtaca agcctaattg 600

tgtagcatct ggcttactga agcagaccct atcatctctc tcgtaaactg ccgtcagagt 660

cggttgggtt ggacagacct ctgagtttct ggtaacgccg ttccgcaccc cggaaatggt 720

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ccaacttact tctgacaacg atcggaggac cgaaggagct aaccgctttt ttgcacaaca 1920

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acgacgagcg tgacaccacg atgcctgtac gaacggcaac aacgttgcgc aaactattaa 2040

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aagttgcagg accacttctg cgctcggccc ttccggctgg ctggtttatt gctgataaat 2160

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gacagatcgc tgagataggt gcctcactga ttaagcattg gtaactgtca gaccaagttt 2340

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<210> 31
<211> 28
<212> PRT
<213> Homo sapiens

<400> 31

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Arg Val Gln Gln Arg Lys
1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
20 25

<210> 32
<211> 28
<212> PRT
<213> Mus musculus

<400> 32

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Ala Gln Gln Arg Lys
1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
20 25

<210> 33
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Linker

<400> 33

Gly Gly Lys Gly Gly
1 5

<210> 34
<211> 3
<212> PRT
<213> Artificial Sequence

<220>
<223> N-terminal glycine linker

<220>
<221> REPEAT
<222> (1)..(1)
<223> Glycine can be repeated from zero to five times

<220>
<221> REPEAT
<222> (3)..(3)
<223> Glycine can be repeated from zero to twelve times

<400> 34

Gly Cys Gly
1

<210> 35
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> N terminal glycine serine linkers

<220>
<221> REPEAT
<222> (1)..(1)
<223> Glycine can be repeated from zero to five times

<220>
<221> REPEAT
<222> (3)..(3)
<223> Glycine can be repeated from zero to ten times

<220>
<221> REPEAT
<222> (4)..(4)
<223> Serine can be repeated from zero to two times

<220>
<221> REPEAT
<222> (5)..(9)
<223> These residues can be repeated from zero to three times as a group

<400> 35

Gly Cys Gly Ser Gly Gly Gly Gly Ser
1 5

<210> 36
<211> 3
<212> PRT
<213> Artificial Sequence

<220>
<223> C-terminal glycine linker

<220>
<221> REPEAT
<222> (1)..(1)
<223> Glycine can be repeated from zero to twelve times

<220>
<221> REPEAT
<222> (3)..(3)
<223> Glycine can be repeated from zero to five times

<400> 36

Gly Cys Gly
1

<210> 37
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> C terminal glycine serine linkers

<220>
<221> REPEAT
<222> (1)..(1)
<223> Glycine can be repeated from zero to ten times

<220>
<221> REPEAT
<222> (2)..(2)
<223> Serine can be repeated from zero to two times

<220>
<221> REPEAT
<222> (3)..(7)
<223> These residues can be repeated from zero to three times as a group

<220>
<221> REPEAT
<222> (8)..(8)
<223> Glycine can be repeated from zero to eight times

<220>
<221> REPEAT
<222> (10)..(10)
<223> Glycine can be repeated from zero to five times

<400> 37

Gly Ser Gly Gly Gly Gly Ser Gly Cys Gly
1 5 10

<210> 38
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Glycine serine linker

<220>
<221> REPEAT
<222> (1)..(5)
<223> These residues can be repeated any times as a group

<400> 38

Gly Gly Gly Gly Ser
1 5

<210> 39
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> N-terminal gamma1

<400> 39

Cys Gly Asp Lys Thr His Thr Ser Pro Pro
1 5 10

<210> 40

<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> C-terminal gamma 1

<400> 40

Asp Lys Thr His Thr Ser Pro Pro Cys Gly
1 5 10

<210> 41
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> N-terminal gamma 3

<400> 41

Cys Gly Gly Pro Lys Pro Ser Thr Pro Pro Gly Ser Ser Gly Gly Ala
1 5 10 15

Pro

<210> 42
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> C-terminal gamma 3

<400> 42

Pro Lys Pro Ser Thr Pro Pro Gly Ser Ser Gly Gly Ala Pro Gly Gly
1 5 10 15

Cys Gly

<210> 43
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> N-terminal glycine linker

<400> 43

Gly Cys Gly Gly Gly Gly
1 5

<210> 44
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> C-terminal glycine linker

<400> 44

Gly Gly Gly Gly Cys Gly
1 5

<210> 45
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> C-terminal glycine-lysine linker

<400> 45

Gly Gly Lys Lys Gly Cys
1 5

<210> 46
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> N-terminal glycine-lysine linker

<400> 46

Cys Gly Lys Lys Gly Gly
1 5

<210> 47
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> C.terminal linker

<400> 47

Gly Gly Cys Gly
1

<210> 48
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Grehlin precursor mutant

<400> 48

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Arg Val Gln Arg Lys Glu
1 5 10 15

Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
20 25

<210> 49
<211> 28
<212> PRT
<213> Canis familiaris

<400> 49

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Leu Gln Gln Arg Lys
1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
20 25

<210> 50
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<220>
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1 5 10 15

Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
20 25

<210> 51
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Mus musculus ghrelin mutant

<400> 51

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Ala Gln Arg Lys Glu
1 5 10 15

Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
20 25

<210> 52
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<213> Homo sapiens

<400> 52

Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
1 5 10

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<400> 53

Pro Pro Ala Lys Leu Gln Pro Arg
1 5

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<400> 54

Ala Lys Leu Gln Pro Arg
1 5

<210> 55
<211> 10
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<400> 55

Gly Ser Ser Phe Leu Ser Pro Glu His Gln
1 5 10

<210> 56
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Glu His Gln Arg Val Gln Gln Arg Lys Glu
1 5 10

<210> 57
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tctagaattt tctgcgcacc catcccgggt ggcgcccaaa gtgaggaaaa tcacatg 57

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<223> Shine-Dalgarno sequence of vector pQb185

<400> 58
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<400> 59

Lys Leu Gln Pro Arg
1 5

<210> 60
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1 5 10

<210> 61
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<400> 61

Gln Arg Lys Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
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<210> 62
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<400> 62

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Leu Gln
1 5 10

<210> 63
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<400> 63

Gln Arg Lys Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
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<210> 64
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Cys Gly Ser Ser Phe Leu Ser Pro Glu His Gln Arg Val Gln Arg Lys
1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
20 25

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<220>
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Lys Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
20 25

<210> 66
<211> 28
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<220>
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<400> 66

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Arg Val Gln Arg Lys Glu
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Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Cys
20 25

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<220>
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<400> 67

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Arg Val Gln Gln Arg Lys
1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Cys
20 25

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<220>
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<400> 68

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Arg Val Gln Cys
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<212> PRT
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Cys Pro Pro Ala Lys Leu Gln Pro Arg
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<210> 71
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<220>
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<400> 71

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1 5 10 15

Lys Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
20 25

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<220>
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<400> 72

Cys Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Leu Gln Arg Lys
1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
20 25

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<220>
<223> dog ghrelin peptide24-51 mutant

<400> 73

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Leu Gln Gln Arg Lys
1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Cys
20 25

<210> 74
<211> 28
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<220>

<223> dog ghrelin mutant

<400> 74

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Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Cys
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<211> 14
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1 5 10

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<400> 76

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<220>
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<400> 77

Cys Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Ala Gln Gln Arg
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Lys Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
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<400> 80
agctcgcccg gggatcctct ag 22

<210> 81
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<212> DNA
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ggcaaaatta gagactgtta ctttaggtaa gatcgg 36

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ggccatggca cgactcgaga ctgttacttt agg 33

<210> 85
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gatttaggtg acactatag 19

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gatggacgtc aaactctggt cctcaatccg cgtgggg 37

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<211> 37
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ccccacgcgg attgaggacc agagtttgac gtccatc 37

<210> 88
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<220>
<223> EcoRIHBcAg(s) primer

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ccggaattca tggacattga cccttataaa g 31

<210> 89
<211> 51
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<220>
<223> Lys-HBcAg(as) primer

<400> 89
cctagagcca cctttgccac catcttctaa attagtaccc acccaggtag c 51

<210> 90
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<213> Artificial Sequence

<220>
<223> Lys-HBcAg(s) primer

<400> 90
gaagatggtg gcaaaggtgg ctctagggac ctagtagtca gttatgtc 48

<210> 91
<211> 38
<212> DNA
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<220>
<223> HBcAg(1-149)Hind(as) primer

<400> 91
cgcgtcccaa gcttctaaac aacagtagtc tccggaag 38

<210> 92
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<223> 48as primer

<400> 92
gtgcagtatg gtgaggtgag gaatgctcag gagactc 37

<210> 93
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<212> DNA
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<400> 93
gagtctcctg agcattcctc acctcaccat actgcac 37

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cttccaaaag tgagggaaga aatgtgaaac cac 33

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<212> DNA
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<210> 96
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<212> DNA
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<220>
<223> HBcAgwtHindIIII primer

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cgcgtcccaa gcttctaaca ttgagattcc cgagattg 38

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<400> 98

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Val

<210> 100
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<220>
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Val

<210> 101
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<220>
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<400> 102

Asp Glu Leu Asn Asn Gly Val
1 5

<210> 103
<211> 31
<212> DNA
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<220>
<223> HBcAg-wt EcoRI fwd primer

<400> 103
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<223> HBcAg-wt Hind III rev primer

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cgcgtcccaa gcttctaaca ttgagattcc cgagattg 38

<210> 105
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1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Gly Cys
20 25 30

<210> 106
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<212> PRT
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<220>
<223> cGhrQ14 mutant

<400> 106

Cys Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Ala Gln Arg Lys
1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
20 25

<210> 107
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<212> PRT
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<220>
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<400> 107

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Ala Gln Arg Lys Glu
1 5 10 15

Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Gly Cys
20 25

<210> 108
<211> 11
<212> PRT
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<220>
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<400> 108

Cys Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
1 5 10

<210> 109
<211> 7
<212> PRT
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<220>
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<400> 109

Cys Ala Lys Leu Gln Pro Arg
1 5

<210> 110
<211> 11
<212> PRT
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<220>
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<400> 110

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Cys

1 5 10

<210> 111
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<212> PRT
<213> Homo sapiens

<400> 111

Glu His Gln Arg Val Gln Gln Arg Lys Glu Ser
1 5 10

<210> 112
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<212> PRT
<213> Mus musculus

<400> 112

Glu His Gln Lys Ala Gln Gln Arg Lys Glu
1 5 10

<210> 113
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<400> 113

Glu His Gln Lys Ala Gln Gln Arg Lys Glu Ser
1 5 10

<210> 114
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<213> Canis familiaris

<400> 114

Glu His Gln Lys Leu Gln Gln Arg Lys Glu
1 5 10

<210> 115
<211> 11
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<213> Canis familiaris

<400> 115

Glu His Gln Lys Leu Gln Gln Arg Lys Glu Ser
1 5 10

<210> 116
<211> 10
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<400> 116

Leu Ser Pro Glu His Gln Arg Val Gln Gln
1 5 10

<210> 117
<211> 10
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<400> 117

Leu Ser Pro Glu His Gln Lys Ala Gln Gln
1 5 10

<210> 118
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<400> 118

Leu Ser Pro Glu His Gln Lys Leu Gln Gln
1 5 10

<210> 119
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<212> PRT
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<400> 119

Gly Ser Ser Phe Leu Ser Pro
1 5

<210> 120
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<220>
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1 5 10 15

Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Gly Cys
20 25

<210> 121
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Gly Ser Ser Phe Leu Ser Pro Glu His Gln Arg Val Gln Gln Arg Lys
1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Gly Cys
20 25 30

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Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Leu Gln Gln Arg Lys
1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Gly Cys
20 25 30

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Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Leu Gln Arg Lys Glu
1 5 10 15

Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Gly Cys
20 25

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<400> 125

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Leu Gln Gly Cys
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<210> 126
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<212> PRT
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<220>
<223> mouse ghrelin peptide mutant

<400> 126

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Ala Gln Arg Lys Glu
1 5 10 15

Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Cys
20 25

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Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Ala Gln Arg Lys Glu
1 5 10 15

Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Gly Cys
20 25

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<400> 128

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Ala Gln Gln Arg Lys
1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Cys
20 25

<210> 129
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<220>
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Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Ala Gln Gln Arg Lys
1 5 10 15

Glu Ser Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg Gly Cys
20 25 30

<210> 130
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<220>
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<400> 130

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Ala Gln Cys
1 5 10

<210> 131
<211> 15
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<220>
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<400> 131

Gly Ser Ser Phe Leu Ser Pro Glu His Gln Lys Ala Gln Gly Cys
1 5 10 15

<210> 132
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<220>
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1 5 10

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Cys Lys Lys Pro Pro Ala Lys Leu Gln Pro Arg
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Cys Glu His Gln Lys Ala Gln Gln Arg Lys Glu
1 5 10

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1 5 10

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Cys Leu Ser Pro Glu His Gln Lys Ala Gln Gln
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<210> 137
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<220>
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<400> 137

Cys Glu His Gln Arg Val Gln Gln Arg Lys Glu Ser
1 5 10

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<211> 11
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<400> 138

Cys Leu Ser Pro Glu His Gln Arg Val Gln Gln
1 5 10

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aatctagaat tttctgcgca cccatcccgg 30

<210> 141
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<400> 144

Met Pro Ser Pro Gly Thr Val Cys Ser Leu Leu Leu Gly Met Leu
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Trp Leu Asp Leu Ala Met Ala Gly Ser Ser Phe Leu Ser Pro Glu His
20 25 30

Gln Arg Val Gln Gln Arg Lys Glu Ser Lys Lys Pro Pro Ala Lys Leu
35 40 45

Gln Pro Arg Ala Leu Ala Gly Trp Leu Arg Pro Glu Asp Gly Gly Gln
50 55 60

Ala Glu Gly Ala Glu Asp Glu Leu Glu Val Arg Phe Asn Ala Pro Phe
65 70 75 80

Asp Val Gly Ile Lys Leu Ser Gly Val Gln Tyr Gln Gln His Ser Gln
85 90 95

Ala Leu Gly Lys Phe Leu Gln Asp Ile Leu Trp Glu Glu Ala Lys Glu
100 105 110

Ala Pro Ala Asp Lys

115

<210> 145
<211> 117
<212> PRT
<213> Canis familiaris

<400> 145

Met Pro Ser Pro Gly Thr Val Cys Ser Leu Leu Leu Leu Gly Met Leu
1 5 10 15

Trp Leu Asp Leu Ala Met Ala Gly Ser Ser Phe Leu Ser Pro Glu His
20 25 30

Gln Lys Leu Gln Gln Arg Lys Glu Ser Lys Lys Pro Pro Ala Lys Leu
35 40 45

Gln Pro Arg Ala Leu Ala Gly Trp Leu Arg Pro Glu Asp Gly Gly Gln
50 55 60

Ala Glu Gly Ala Glu Asp Glu Leu Glu Val Arg Phe Asn Ala Pro Phe
65 70 75 80

Asp Val Gly Ile Lys Leu Ser Gly Val Gln Tyr Gln Gln His Ser Gln
85 90 95

Ala Leu Gly Lys Phe Leu Gln Asp Ile Leu Trp Glu Glu Ala Lys Glu
100 105 110

Ala Pro Ala Asp Lys
115

<210> 146
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<400> 146

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1 5 10 15

Trp Leu Asp Leu Ala Met Ala Gly Ser Ser Phe Leu Ser Pro Glu His
20 25 30

Gln Lys Ala Gln Gln Arg Lys Glu Ser Lys Lys Pro Pro Ala Lys Leu
35 40 45

Gln Pro Arg Ala Leu Ala Gly Trp Leu Arg Pro Glu Asp Gly Gly Gln

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    50                  55                  60

Ala Glu Gly Ala Glu Asp Glu Leu Glu Val Arg Phe Asn Ala Pro Phe
65                  70                  75                  80

Asp Val Gly Ile Lys Leu Ser Gly Val Gln Tyr Gln Gln His Ser Gln
                85                  90                  95

Ala Leu Gly Lys Phe Leu Gln Asp Ile Leu Trp Glu Glu Ala Lys Glu
            100                 105                 110

Ala Pro Ala Asp Lys
        115
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